



## STORAGWORKS HSJ40 SUBSYSTEMS

Preconfigured Solutions for the Computer Interconnect  
Using the StorageWorks HSJ40 Array Controller

**digital**



Industry-standard storage for  
high-end systems

Poised for growth

Easily customized

Complete packages include  
everything you need

Starting with a preconfigured solution is the fastest way to put reliable, industry-standard storage to work on your CI (Computer Interconnect) cluster. Whether these packages meet your exact requirements right out of the box or become the foundation for your customized system, Digital's SW series packages make choosing StorageWorks products easy. Every component and internal cable you'll need is included, and expansion opportunities are clear.

Order one or two HSJ40 controllers configured with the cache size you require, and the appropriate length CI cables. Then select one of the SW series of preconfigured solutions to get all the components you need — including cabinet, controller shelf, building-block shelves, building blocks (3.5-inch or 5.25-inch disk drives), power supplies, and internal cables. Subsystem packages begin with storage capacities of 6.3, 12.6, or 21.4 GB. When you order one or two controllers and an SW series package together, you'll receive a fully integrated solution all ready for power-up.

As the central element matched with all SW series preconfigured subsystems, the industry-leading technology of the HSJ40 makes high-end storage possible using collections of low-cost devices. Attaching directly to the CI star coupler, one or two controllers connect up to 36 devices via six SCSI-2 (Small Computer System Interface-2) buses. Upgradable firmware and cache within the controller enable it to provide performance-optimizing services for disk drives attached to it, including RAID (Redundant Array of Independent Disks) technology.



## HIGHLIGHTS

Combined with one or two controllers (ordered separately), these packages provide everything you need to put high-end SCSI-2 storage on the CI.

Systems include choice of two datacenter cabinets to meet varying levels of projected growth.

Double or triple your initial capacity simply by inserting additional devices into available slots.

Starting with as few as 6 GB, you can expand to nearly 70 GB in the small cabinet, or over 225 GB in the tall cabinet.

Use any supported device to add capacity; Digital's modular approach lets you mix and match.

Gain high availability by using two controllers, dual power supplies, and dual power distribution units.

RAID-capable HSJ40 controller can work with host-based Volume Shadowing to boost performance and improve availability.

Available for worldwide use.

## SW810 AND SW510 ENTRY PACKAGES BEGIN WITH 6.3 GB

To build the entry-level packages, Digital installs six 1.05-GB RZ26 storage building blocks into three StorageWorks building-block shelves. The RZ26 building block is a 3.5-inch disk drive in a carrier that snaps into a building-block shelf. To build the SW810 package, Digital mounts the three building-block shelves and controller shelf into the 1700-mm-tall SW800 cabinet. To configure the SW510 package, Digital mounts the same components into the SW500 cabinet that stands 1100 mm high.

To balance the I/O activity, each drive is cabled to a separate port on the controller. This takes advantage of each building-block shelf's capability to support two SCSI buses. Since these subsystems include two 3.5-inch RZ26 disk building blocks per building-block shelf, four slots remain available on each shelf for expansion.

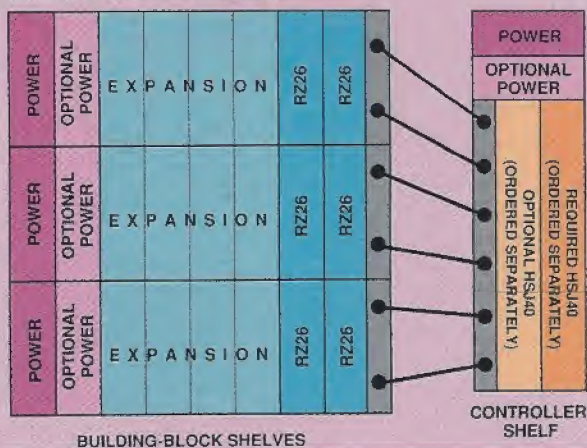
## SW811 AND SW511 STARTER PACKAGES BEGIN WITH 21.4 GB

The SW811 and SW511 packages are ideal starting points

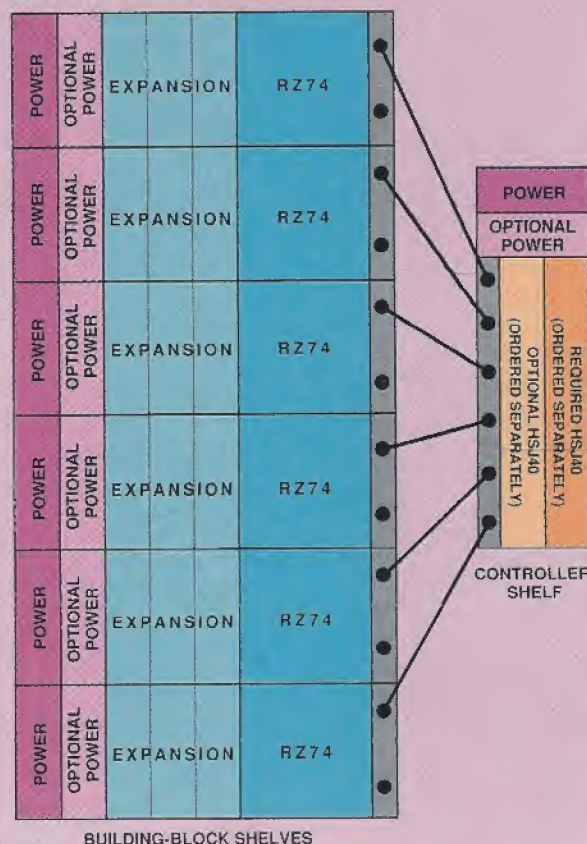
in the StorageWorks family if your immediate storage needs are for 20 to 50 GB of low-cost storage.

To configure this pair of StorageWorks packages, Digital installs six 3.5-GB RZ74 storage building blocks into six building-block shelves. The RZ74

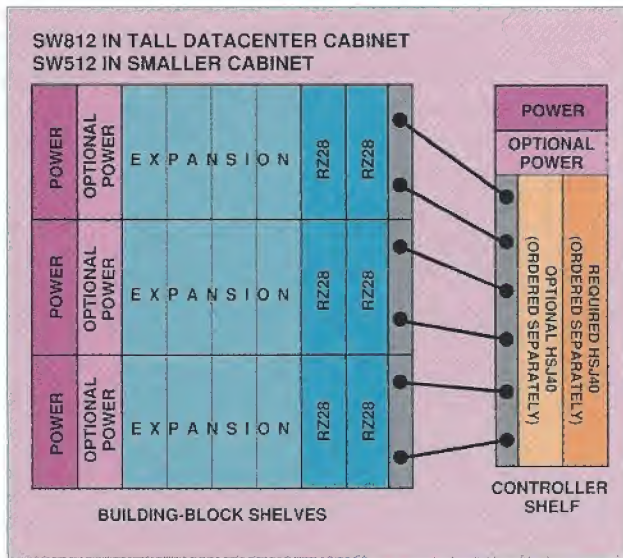
SW810 IN TALL DATACENTER CABINET  
SW510 IN SMALLER CABINET



SW811 IN TALL DATACENTER CABINET  
SW511 IN SMALLER CABINET







building block is a 5.25-inch disk drive mounted in a carrier that occupies three slots in a building-block shelf. Each shelf is cabled to a separate port on the HSJ40 controller. The six building-block shelves, plus a controller shelf, are installed in the SW800 cabinet to make the SW811 subsystem, or in the SW500 cabinet to make the SW511 subsystem.

### SW812 AND SW512 STARTER PACKAGES GROW FROM 12.6 GB

If you require a considerable amount of storage, the SW812 and SW512 packages are the starting points for the industry's most densely packed storage solutions. Six 2.1-GB RZ28 drives are installed in three building-block shelves. Together with a controller shelf, Digital mounts these building-block shelves in the large datacenter cabinet to make an SW812 subsystem, or the small cabinet to make an SW512 subsystem.

Need a quick 75 GB? Start with one of these packages and completely fill the three shelves provided with 12 more RZ28 building blocks for a total of 37.8 GB. Then add three more shelves, each with six RZ28 building blocks for another 37.8 GB. That's a grand total of 75.6 GB in just seven

StorageWorks shelves. Replicate that three times in the large datacenter cabinet, and you'll have over 225 GB installed in a footprint of 0.7 square meters — about 7.5 square feet!

### CONFIGURING FOR HIGHER AVAILABILITY

Digital designed the StorageWorks archi-

ture as a modular set of interchangeable elements to make configuring for high availability exceptionally easy.

You can configure your storage subsystem to have few or no single points of potential failure simply by installing additional elements that will take over if the primary components fail.

- Second controller: Installing a second controller automatically dual-paths the attached devices. If one controller fails, the disk drives will be accessed by the remaining controller.
- Redundant power supplies: You can add a second power supply to each shelf and still configure to the maximum recommended number of devices.
- Second power distribution unit: Whenever you configure shelves with dual power supplies, it makes sense to cable the second set of power supplies to an optional second power distribution unit. By using the color-coded power cords supplied, it's easy to ensure that the dual power supplies receive power from isolated sources.
- Battery backup units: In place of dual power supplies in the shelves connected to two power distribution units, you can insert a carrier-mounted battery backup unit into each StorageWorks shelf.

- RAID technology: HSJ40 controllers support host-based Volume Shadowing (RAID 1), which can replicate data two or even three times for high availability. Controller-based RAID options that preserve access to data even in the event of a drive failure will be available in subsequent versions of the HSJ40's upgradable firmware.

### CONFIGURING FOR HIGHER PERFORMANCE

The StorageWorks modular design enables you to control many factors that affect the performance of your storage subsystem. For example, using dual controllers improves availability and doubles the maximum number of I/O requests that can be serviced per second.

Controller-based RAID 0 (disk striping) offers substantial performance gains for many applications. You can implement RAID 0 along with host-based Volume Shadowing (RAID 1). Volume Shadowing increases performance in addition to providing higher availability.

Spreading your data across a number of disk drives improves response times. This is why many system owners choose small-capacity fast disk drives for priority storage and large-capacity drives — costing less per megabyte — to store data that does not require the fastest access. Since your preconfigured package includes 1-GB, 2.1-GB, or 3.5-GB disk drives, you can add any combination of supported drives. Additional choices, including solid-state disk drives, will be available in the near future.

## CONFIGURING FOR HIGHER CAPACITY

Want to double or triple the initial capacity of these subsystems? Simply insert more building blocks into available slots. Up to 36 devices can be serviced by one or two HSJ40 controllers, making it possible to dramatically expand the total capacity of your subsystem.

The large cabinet holds 18 building-block shelves plus four controller shelves. The small cabinet holds nine building-block shelves plus one controller shelf. In either cabinet, you can install one or two half-rack tape magazine subsystems in place of four shelves.

## STORAGWORKS SUBSYSTEMS: PERFORMANCE, CAPACITY, AND VALUE

The StorageWorks architecture gives you unprecedented freedom to design and, when necessary, reconfigure your storage investments to meet changing requirements. To span just a few to hundreds of gigabytes, Digital developed preconfigured subsystems as convenient entry points into the modular world of StorageWorks. You'll find the best storage value with the flexible configurations these StorageWorks packages make possible.

## SPECIFICATIONS

Packages:	SW810	SW510	SW811	SW511	SW812	SW512
Cabinet	SW800	SW500	SW800	SW500	SW800	SW500
Building-block shelves	3	3	6	6	3	3
Controller shelves	1	1	1	1	1	1
HSJ40 controllers (ordered separately) supported with package components	2	2	2	2	2	2
Maximum HSJ40 controllers supported in cabinet	8	2	8	2	8	2
Peak I/O requests/s						
Single controller	1100	1100	1100	1100	1100	1100
Dual controllers	2200	2200	2200	2200	2200	2200
Bandwidth (MB/s)	4.0	4.0	4.0	4.0	4.0	4.0
Building blocks:						
Model	RZ26	RZ26	RZ74	RZ74	RZ28	RZ28
Form-factor (inch)	3.5	3.5	5.25	5.25	3.5	3.5
Capacity (GB)	1.05	1.05	3.57	3.57	2.1	2.1
Quantity supplied	6	6	6	6	6	6
Capacities:						
Initial total capacity (GB)	6.3	6.3	21.4	21.4	12.6	12.6
Maximum capacity using supplied shelves and same model building blocks (GB)	18.9	18.9	42.8	42.8	37.8	37.8
Maximum capacity per cabinet using additional HSJ40s (SW800 cabinets only), additional shelves, and RZ28 building blocks (GB)	220.5	69.3	210.4	71.8*	226.8	75.6

\*Two shelves can be daisy-chained on one SCSI bus to a maximum of six devices.

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